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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,986	12/24/2003	Akihiro Mochizuki	350292001900	3442

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EXAMINER	
CHOWDHURY, TARIFUR RASHID	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/766,986	MOCHIZUKI ET AL.	
	Examiner	Art Unit	
	Tarifur R. Chowdhury	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29,31 and 32* is/are pending in the application.

4a) Of the above claim(s) *8-29 and 31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 2 and 7 are objected to because of the following informalities:

In claim 2, line 2, "the liquid crystal material is a liquid crystal material which can show" should be changed to –the liquid crystal material which can show--.

In claims 7, line 2, "larger the panel" should be changed to –larger than the panel--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Takatori et al., (Takatori), USPAT 6,040,889.

4. Takatori discloses and shows in Fig. 5, a liquid crystal display device comprising: at least,

- a pair of substrates (1, 2); and
- a liquid crystal material disposed between the substrates;

wherein the molecular initial alignment (conducted by rubbing shown in Fig. 15A) in the liquid crystal material has a parallel or almost parallel direction with respect to the alignment treatment direction for the liquid crystal material; and the liquid crystal

material shows almost no spontaneous polarization which is perpendicularly to the pair of substrates under the absence of an externally applied voltage (col. 4, lines 36-46).

Accordingly, claims 1 and 3 are anticipated.

As to claim 2, Takatori also discloses (col. 9, lines 42-44) and shows in Fig. 12 that the antiferroelectric liquid crystal that exhibited a phase transition behavior and having a SmC_A^* phase (ferroelectric property) was injected into the liquid crystal cell.

As to claims 4 and 5, Takatori also discloses that the liquid crystal molecular alignment treatment for the liquid crystal material is conducted in conjunction with a liquid crystal molecular alignment material providing a low surface pre-tilt angle of less than 1.5 degrees (col. 9, lines 14-29).

As to claim 6, it is clear from Fig. 5 of Takatori that the liquid crystal material shows a bookshelf structure at the SmC_A^* phase.

As to claim 32, Takatori also discloses and shows in Fig. 15A an extinction angle under the absence of an externally applied voltage, when the liquid crystal device is inserted between a polarizer and an analyzer which are arranged in a cross-Nicole relationship.

5. **Claims 1-3 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al., (Tanaka), USPAT 5,847,799.**

6. Tanaka discloses and shows in Figs. 1-6, liquid crystals display device comprising: at least,

- a pair of substrates (11, 12); and
- a liquid crystal material (21) disposed between the substrates;

wherein the molecular initial alignment conducted by rubbing (col. 10, lines 14-20) in the liquid crystal material has a parallel or almost parallel direction with respect to the alignment treatment direction for the liquid crystal material (col. 4, lines 39-45); and the liquid crystal material shows almost no spontaneous polarization which is perpendicularly to the pair of substrates under the absence of an externally applied voltage (col. 12, lines 36-67)

Accordingly, claims 1 and 3 are anticipated.

As to claim 2, Takatori also discloses (col. 10, lines 31-34) that the liquid crystal material can show ferroelectric property.

As to claim 32, Tanaka shows in Fig. 3 and discloses in corresponding text, an extinction angle under the absence of an externally applied voltage, when the liquid crystal device is inserted between a polarizer and an analyzer, which are arranged in a cross-Nicole relationship.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takatori in view of Kitayama et al., (Kitayama), USPAT 5,583,682.

9. Takatori differs from the claimed invention because he does not explicitly disclose that the helical pitch at the ferroelectric liquid crystal phase is 1.2 times or larger than the panel gap of the liquid crystal device.

Kitayama discloses an LC device where the helical pitch at the ferroelectric LC phase is 1.2 times or larger than the panel gap (col. 4, lines 23-26).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to set the helical pitch at the ferroelectric LC phase at 1.2 times or larger than the panel gap since one would be motivated to keep the LC at low temperature (col. 3, line 25) by compensating distortion or deformation due to shrinkage during structural changes (col. 4, lines 1-7) in order to minimize deterioration in display characteristics and problems with low temperature storage (col. 3, lines 25, 48-51). Ultimately, this serves to provide an LC device with improved gradation display characteristics (col. 2, lines 8-10).

Accordingly, claim 7 would have been obvious.

10. **Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Kitayama.**

11. Tanaka differs from the claimed invention because he does not explicitly disclose that the liquid crystal material shows a bookshelf or quasi-bookshelf structure and that the helical pitch at the ferroelectric liquid crystal phase is 1.2 times or larger than the panel gap of the liquid crystal device.

Kitayama discloses an LC device wherein the LC material shows a bookshelf layer structure or quasi-bookshelf structure and where the helical pitch at the ferroelectric LC phase is 1.2 times or larger than the panel gap (col. 4, lines 23-26).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have for the LC material to have a bookshelf or quasi-bookshelf structure and where the helical pitch at the ferroelectric LC phase at 1.2 times or larger than the panel gap since one would be motivated to keep the LC at low temperature (col. 3, line 25) by compensating distortion or deformation due to shrinkage during structural changes (col. 4, lines 1-7) in order to minimize deterioration in display characteristics and problems with low temperature storage (col. 3, lines 25, 48-51). Ultimately, this serves to provide an LC device with improved gradation display characteristics (col. 2, lines 8-10).

Accordingly, claims 6 and 7 would have been obvious.

12. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Takatori.

13. Tanaka differs from the claimed invention because he does not explicitly disclose that the liquid crystal molecules provide a surface pre-tilt angle of 1.5 degrees or less.

Takatori discloses a liquid crystal display device wherein the liquid crystal molecules provide a surface pre-tilt angle of 1.5 degrees or less (col. 9, lines 14-29).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have a surface pre-tilt angle of 1.5 degrees or less to obtain a display device that enables continuous gray-scale display, facilitates orientation of liquid crystal, and moreover, provide wide viewing angle (col. 3, lines 30-34)

Accordingly, claims 4 and 5 would have been obvious.

Response to Arguments

14. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R. Chowdhury whose telephone number is (571) 272-2287. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TRC
May 14, 2006

TARIFUR R. CHOWDHURY
PRIMARY EXAMINER